

1069427 16 JUL 2002

10/069427  
PATENT**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In the Application of:

OMOLAYO O. FAMODU ET AL.

CASE NO.: BB1395 US PCT

APPLICATION NO.: 10/069,427

GROUP ART UNIT: UNKNOWN

FILED: UNKNOWN

EXAMINER: UNKNOWN

INTERNATIONAL APPLICATION NO.: PCT/US00/26442

INTERNATIONAL FILING DATE: SEPTEMBER 9, 2000

FOR: GENES ENCODING STEROL  
DELTA-15 REDUCTASE IN PLANTS**STATEMENT UNDER 37 CFR 1.821(g) and 1.825(b)**

Commissioner for Patents, Box PCT  
United States Patent and Trademark Office  
Washington, DC 20231

Sir:

The submission of the substitute Sequence Listing filed concurrently herewith does not include new matter.

The copy of the substitute Sequence Listing in computer readable form filed concurrently herewith is the same as the paper copy of the substitute Sequence Listing filed concurrently herewith.

Respectfully submitted,



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Facsimile: 302-892-1026

Dated: July 11, 2002

10/069427

SEQUENCE LISTING

<110> Famodu, Omolayo O.  
Kinney, Anthony J.

<120> Genes Encoding Sterol Delta-15 Reductase in Plants

<130> BB1395 PCT

<140> 10/069,427

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<150> 60/156,820

<151> 1999-09-30

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<221> unsure

<222> (360)

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20 25 30

Val Pro Gly Val Ala Leu Leu Asp Gly Thr Arg Leu His Tyr Cys Cys  
35 40 45

Asn Gly Leu Leu Ser Leu Leu Val Ala Leu Leu Gly Ile Gly  
50 55 60

Ala Lys Met Gly Phe Val Ser Pro Thr Ala Ile Ser Asn Arg Gly Leu

65

70

75

80

Glu Leu Leu Ser Thr Thr Phe Ala Phe Ser Phe Leu Val Thr Leu Ile  
 85 90 95

Leu His Phe Ser Gly Cys Lys Ser Gln Ser Lys Gly Ser Ser Leu Lys  
 100 105 110

Pro His Leu Ser Gly Asn Leu Ile His Asp Trp Trp Phe Gly  
 115 120 125

&lt;210&gt; 3

&lt;211&gt; 1631

&lt;212&gt; DNA

&lt;213&gt; Glycine max

&lt;400&gt; 3

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atccattctc	cctggaaaac	ttgttccctgg	cgttgcacta	ctcgatggaa	ctcgcttaca	240
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&lt;211&gt; 374

&lt;212&gt; PRT

&lt;213&gt; Glycine max

&lt;400&gt; 4

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20	25	30	

Ala Val Ala Gly Ser Ile Leu Pro Gly Lys Leu Val Pro Gly Val Ala  
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           50                  55                  60  
  
 Leu Leu Leu Leu Val Ala Leu Leu Gly Ile Gly Ala Lys Met Gly Phe  
   65                  70                  75                  80  
  
 Val Ser Pro Thr Ala Ile Ser Asp Arg Gly Leu Glu Leu Leu Ser Thr  
           85                  90                  95  
  
 Thr Phe Ala Phe Ser Phe Leu Val Thr Leu Ile Leu His Phe Ser Gly  
           100                  105                  110  
  
 Cys Lys Ser Gln Ser Lys Gly Ser Ser Leu Lys Pro His Leu Ser Gly  
   115                  120                  125  
  
 Asn Leu Ile His Asp Trp Trp Phe Gly Ile Gln Leu Asn Pro Gln Phe  
   130                  135                  140  
  
 Met Gly Ile Asp Leu Lys Phe Phe Val Arg Ala Gly Met Met Gly  
   145                  150                  155                  160  
  
 Trp Leu Leu Ile Asn Leu Ser Ile Leu Met Lys Ser Ile Gln Asp Gly  
           165                  170                  175  
  
 Thr Leu Ser Gln Ser Met Ile Leu Tyr Gln Leu Phe Cys Ala Leu Tyr  
           180                  185                  190  
  
 Ile Leu Asp Tyr Phe Val His Glu Glu Tyr Met Thr Ser Thr Trp Asp  
   195                  200                  205  
  
 Ile Ile Ala Glu Arg Leu Gly Phe Met Leu Val Phe Gly Asp Leu Val  
   210                  215                  220  
  
 Trp Ile Pro Phe Ser Phe Ser Ile Gln Gly Trp Trp Leu Leu Met Asn  
   225                  230                  235                  240  
  
 Ser Val Glu Leu Thr Pro Ala Ala Ile Val Ala Asn Cys Phe Val Phe  
   245                  250                  255  
  
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   260                  265                  270  
  
 Phe Lys Lys Asn Pro Lys Ala Pro Ile Trp Gly Lys Pro Pro Lys Val  
   275                  280                  285  
  
 Ile Gly Gly Lys Leu Leu Ala Ser Gly Tyr Trp Gly Ile Ala Arg His  
   290                  295                  300  
  
 Cys Asn Tyr Leu Gly Asp Leu Met Leu Ala Leu Ser Phe Ser Leu Pro  
   305                  310                  315                  320  
  
 Cys Gly Ile Ser Ser Pro Ile Pro Tyr Phe Tyr Pro Ile Tyr Leu Leu  
   325                  330                  335  
  
 Ile Leu Leu Ile Trp Arg Glu Arg Arg Asp Glu Ala Arg Cys Ala Glu  
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Ile Leu Pro Tyr Val Tyr  
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aaggacccca aagctcctat atggggaaaa cctcccaaag ttgtcgaaaa aaagctacta 180
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aaaaaaaaag 667
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<212> PRT  
<213> Zea mays

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Asn Lys Gln Lys His Val Phe Lys Lys Asp Pro Lys Ala Pro Ile Trp  
35 40 45

Gly Lys Pro Pro Lys Val Val Gly Gly Lys Leu Leu Ala Ser Gly Tyr  
50 55 60

Trp Gly Ile Ala Arg His Cys Asn Tyr Leu Gly Asp Leu Leu Leu Ala  
 65                    70                    75                    80

Leu Ser Phe Ser Leu Pro Cys Gly Val Ser Ser Val Val Pro Tyr Phe  
85 90 95

Tyr Pro Thr Tyr Leu Leu Ile Leu Leu Val Leu Arg Glu Arg Arg Asp  
100 105 110

Glu Ala Arg Cys Ser Gln Lys Tyr Arg Glu Ile Trp Ala Glu Tyr Cys  
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aatggctgc	tctcgcttc	tctgtgggt	gcacttctcg	ggatcggtgc	caagatgggt	300
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					20				25				30		

Ala	Val	Ala	Gly	Ser	Ile	Leu	Pro	Gly	Lys	Leu	Val	Pro	Gly	Val	Ala
					35			40				45			

Leu	Leu	Asp	Gly	Thr	Arg	Leu	His	Tyr	Cys	Cys	Asn	Gly	Leu	Leu	Ser
					50			55			60				

Leu	Leu	Leu	Leu	Val	Ala	Leu	Leu	Gly	Ile	Gly	Ala	Lys	Met	Gly	Phe
					65			70		75		80			

Val	Ser	Pro	Thr	Ala	Ile	Ser	Asp	Arg	Gly	Leu	Glu	Leu	Leu	Ser	Thr
					85			90				95			

Thr	Phe	Ala	Phe	Ser	Phe	Leu	Val	Thr	Leu	Ile	Leu	His	Phe	Ser	Gly
					100			105				110			

Cys	Lys	Ser	Gln	Ser	Lys	Gly	Ser	Ser	Leu	Lys	Pro	His	Leu	Ser	Gly
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

115

120

125

Asn Leu Ile His Asp Trp Trp Phe Gly Ile Gln Leu Asn Pro Gln Phe  
 130 135 140

Met Gly Ile Asp Leu Lys Ala Gly Met Met Gly Trp Leu Leu Ile Asn  
 145 150 155 160

Leu Ser Ile Leu Met Lys Ser Ile Gln Asp Gly Thr Leu Ser Gln Ser  
 165 170 175

Met Ile Leu Tyr Gln Leu Phe Cys Ala Leu Tyr Ile Leu Asp Tyr Phe  
 180 185 190

Val His Glu Glu Tyr Met Thr Ser Thr Trp Asp Ile Ile Ala Glu Arg  
 195 200 205

Leu Gly Phe Met Leu Val Phe Gly Asp Leu Val Trp Ile Pro Phe Ser  
 210 215 220

Phe Ser Ile Gln Gly Trp Trp Leu Leu Met Asn Ser Val Glu Leu Thr  
 225 230 235 240

Pro Ala Ala Ile Val Ala Asn Cys Phe Val Phe Leu Ile Gly Tyr Met  
 245 250 255

Val Phe Arg Gly Ala Asn Lys Gln Lys His Val Phe Lys Lys Asn Pro  
 260 265 270

Lys Ala Pro Ile Trp Gly Lys Pro Pro Lys Val Ile Gly Gly Lys Leu  
 275 280 285

Leu Ala Ser Gly Tyr Trp Gly Ile Ala Arg His Cys Asn Tyr Leu Gly  
 290 295 300

Asp Leu Met Leu Ala Leu Ser Phe Ser Leu Pro Cys Gly Ile Ser Ser  
 305 310 315 320

Pro Ile Pro Tyr Phe Tyr Pro Ile Tyr Leu Leu Ile Leu Ile Trp  
 325 330 335

Arg Glu Arg Thr Asp Glu Ala Arg Cys Ala Glu Lys Tyr Arg Glu Ile  
 340 345 350

Trp Ala Glu Tyr Arg Lys Leu Val Pro Trp Arg Ile Leu Pro Tyr Val  
 355 360 365

Tyr  
 369

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 <213> Ascobolus immersus

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20

25

30

Thr Pro Arg Gly Ala Pro Pro Pro Glu Phe Trp Ser Ala Pro Leu Glu  
 35 40 45

Thr Leu Lys Ser Val Thr Pro Thr Phe Ser Ser Leu Phe Ser Leu His  
 50 55 60

Ala Thr Leu Ala Val Ala Ala Tyr Tyr Leu Leu Leu Val Ala Leu Met  
 65 70 75 80

Tyr Val Leu Pro Ala Glu Ile Ala Glu Gly Val Val Leu Lys Asp Gly  
 85 90 95

Ser Arg Leu Lys Tyr Arg Cys Asn Ala Phe Thr Thr Phe Leu Val Phe  
 100 105 110

Phe Thr Phe Leu Gly Thr Met Thr Val Leu Glu Gly Pro Thr Trp Trp  
 115 120 125

Phe Trp Ser Tyr Leu Thr Asp Asn Phe Ala Gln Leu Gln Ser Ala Ser  
 130 135 140

Ile Val Phe Ser Tyr Ala Met Ser Leu Trp Val Tyr Ile Arg Ser Tyr  
 145 150 155 160

Arg Pro Met Pro Lys Gly Lys Glu Val Ile Leu Ser Pro Val Gly Phe  
 165 170 175

Lys Gly Asn His Ile His Asp Phe Trp Met Gly Arg Glu Leu Asn Pro  
 180 185 190

Arg Ile Gly Glu Trp Leu Asp Ile Lys Gln Leu His Glu Leu Arg Pro  
 195 200 205

Gly Leu Met Gly Trp Ile Leu Phe Asn Leu Ala Trp Thr Val Lys Gln  
 210 215 220

Tyr Asn Thr His Gly Phe Val Ser Asp Ser Ile Val Leu Val Asn Leu  
 225 230 235 240

Phe Glu Thr Trp Tyr Val Val Asp Ala Leu Trp Asn Glu Ser Lys Val  
 245 250 255

Leu Thr Thr Met Asp Ile Thr Thr Asp Gly Leu Gly Val Met Leu Leu  
 260 265 270

Phe Gly Asn Ala Val Trp Val Pro Phe Met Tyr Cys Leu Gln Ala Arg  
 275 280 285

Tyr Leu Ala Ser Phe Pro Val His Leu Gly Leu Leu Gly Ile Ala Gly  
 290 295 300

Val Leu Ala Val Gln Phe Thr Gly Tyr Ala Ile Phe Arg Gly Ala Asn  
 305 310 315 320

Asn Gln Lys Asn Ala Phe Arg Thr Asn Pro Ala Asp Pro Ala Val Ser  
 325 330 335

His Leu Lys Phe Met Thr Thr Lys Ser Gly Ser Lys Leu Leu Ile Ser

340

345

350

Gly Trp Trp Gly Val Ala Arg His Val Asn Tyr Phe Gly Asp Trp Ile  
 355 360 365

Met Ala Trp Ser Tyr Cys Leu Thr Thr Gly Phe Asn Thr Pro Leu Thr  
 370 375 380

Tyr Phe Tyr Val Ile Tyr Phe Gly Ile Leu Leu Leu His Arg Asp Arg  
 385 390 395 400

Arg Asp Glu Ala Lys Cys Arg Glu Lys Tyr Gly Lys Asp Trp Asp Arg  
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Tyr Cys Lys Val Val Lys Trp Arg Ile Ile Pro Gly Ile Tyr  
 420 425 430

&lt;210&gt; 10

&lt;211&gt; 365

&lt;212&gt; PRT

&lt;213&gt; Arabidopsis thaliana

&lt;400&gt; 10

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Val Phe Tyr Phe Val Tyr Leu Ala Val Ala Gly Glu Ile Leu Pro Gly  
 20 25 30

Lys Val Ile Arg Gly Val Leu Leu Ser Asp Gly Ser Gln Leu Arg Tyr  
 35 40 45

Arg Cys Asn Gly Leu Leu Ala Leu Ile Leu Leu Val Ala Ile Leu Gly  
 50 55 60

Ile Cys Ala Lys Leu Gly Ile Val Ser Pro Leu Val Val Ala Asp Arg  
 65 70 75 80

Gly Leu Glu Leu Leu Ser Ala Thr Phe Ile Phe Cys Val Leu Val Thr  
 85 90 95

Leu Ala Leu Tyr Val Thr Gly Arg Ser Ser Ser Asn Lys Gly Ser Ser  
 100 105 110

Leu Lys Pro His Val Ser Gly Asn Leu Val His Asp Trp Trp Phe Gly  
 115 120 125

Ile Gln Leu Asn Pro Gln Phe Met Ser Ile Asp Leu Lys Phe Phe Phe  
 130 135 140

Val Arg Ala Gly Met Met Gly Trp Leu Leu Ile Asn Leu Ser Ile Leu  
 145 150 155 160

Ala Lys Ser Val Gln Asp Gly Ser Leu Ser Gln Ser Met Ile Leu Tyr  
 165 170 175

Gln Ile Phe Cys Ala Leu Tyr Ile Leu Asp Tyr Phe Val His Glu Glu  
 180 185 190

Tyr Met Thr Ser Thr Trp Asp Ile Ile Ala Glu Arg Leu Gly Phe Met  
195 200 205

Leu Val Phe Gly Asp Leu Leu Trp Ile Pro Phe Thr Phe Ser Ile Gln  
210 215 220

Gly Trp Trp Leu Leu His Asn Lys Val Glu Leu Thr Val Pro Ala Ile  
225 230 235 240

Val Val Asn Cys Leu Val Phe Leu Ile Gly Tyr Met Val Phe Arg Gly  
245 250 255

Ala Asn Lys Gln Lys His Ile Phe Lys Lys Asn Pro Lys Thr Pro Ile  
260 265 270

Trp Gly Lys Pro Pro Val Val Gly Gly Lys Leu Leu Val Ser Gly  
275 280 285

Tyr Trp Gly Ile Ala Arg His Cys Asn Tyr Leu Gly Asp Leu Met Leu  
290 295 300

Ala Leu Ser Phe Ser Leu Pro Cys Gly Ile Ser Ser Pro Val Pro Tyr  
305 310 315 320

Phe Tyr Pro Ile Tyr Leu Leu Ile Leu Ile Trp Arg Glu Arg Arg  
325 330 335

Asp Glu Val Arg Cys Ala Glu Lys Tyr Lys Glu Ile Trp Ala Glu Tyr  
340 345 350

Leu Arg Leu Val Pro Trp Arg Ile Leu Pro Tyr Val Tyr  
355 360 365